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PYTHAGORAS AND ARCHIMEDES.

BY J. D. BELL.

I FIND two of all the ancients whose lives to me seem thronged with the finest incidents of intellectual experience. I take these men to be instances of the most exquisite and intense happiness possible to be enjoyed on earth. They were men of more brain than any thing else; which is to say, that they lived less in the outer world than in the inner. They were discoverers of new ideas and new forces. More than that, they, often and often, were discoverers overjoyed. I scarcely need hint to you, my reader, that from the study of these two examples, you may derive many inspiring ideas and elevating lessons.

I. Let Pythagoras take your attention first.

It may please you, as it does me, to go back through the centuries, and trace something special in the character and life of this great ancient. Thus to do is to see a man who had come to be more than a mere user of his hands, and more than a mere gleaner with his mind, longing and toiling ever, after the beautiful and grand of the yet unexplored parts of creation.

All the noble things in the world have taken their origin in just such men as was Pythagoras of Samos. That is to say, he was an uncommon man, and uncommon works were among his works.

He was the founder of a school of philosophy—the Italian school so called. He was more than that. Being asked by King Leon, of Phlius, what was his profession, he sublimely answered, that he was a lover of wisdom—a *philosophos*, and not a *sophos*; for the Deity only, he declared, is worthy the title of *sage*.

Pause, reader, upon this profession of Pythagoras, the best that was ever made by man. You shall, then, soon be prepared to hear the greatest of things about that majestic ancient, without thinking at all to ask, "How could this be so?"

What if at Crotona he built up a great unique society, composed of six hundred seekers with him, after what Socrates in a later age called "the interior beauty of the soul?" What if his opinion on any subject of thought was, while he lived, taken by all who learned of him, as authority weighty enough to supersede the necessity of proof? What if after his death his scholars paid him divine honors? And what if some modern German has called him "The Fabulous Wonder-Man?" These things all are but natural corollaries of the life of an ancient lover of wisdom.

History tells us not all of the discoveries made by Pythagoras. We know that to his disciples he openly taught doctrines aided by images and symbols, which seemed to them divine oracles. We know that he inculcated lessons in secret, dispensing with those aids which elevated the chosen ones who heard them into *Pythagoreans*. What these latter teachings were, you can not know, and I can not. Did they contain the germs of great theories, which our times see in application? Did they embrace sublime truths in regard to God and immortality, which none of that far-off mythic age, but such as had purged their souls of all dross, by a long-continued course of mental and moral discipline, were capable of understanding? There is no voice to answer these questions. We do but know that in the secret place of his private and higher instructions, Pythagoras communicated discoveries, which only he and those who, by having passed the trials prescribed by him, had gained the privilege of hearing the familiar words of his wise lips, could feel the wonderful magic of.

Such a man as this man must have gone in thought many centuries ahead of his own. He was all right for thinking astonishingly—all right for thinking on into future civilizations. What he saw in the beauty of reality, all living contemporaries but those he had made in a good degree like himself, doubtless would have heard described, only to sneer at it. It pleases me to imagine that lofty thinker, lingering in the enchanting silence of his own deep meditations and feeling thrills of rapture, now and then, which could not but have still remained secrets of his own, even if he had tried to communicate them to others. I love to imagine him in his elevation of life, his quiet dignity, his impressive gravity, his temperance, his virtue, his self-control. I love to conceive of his face, showing in its paleness, not the want of bodily health, but the superiority of his restless mind. I love to think of him as abstaining habitually from animal food, and welcoming with a right relish all vegetables, excepting—*beans*! What pleasure to conceive of him as one among his pupils living in perfect concord; rising with them in the morning early enough to worship the outbursting sun; then determining how the day was to be spent; joining with them afterward in reciting Homeric verses, or in vocal singing, in order to fit his own and their mental powers for the severe activities soon to be entered upon; passing with them, then, into the intense tranquillity of serious study; after several hours, pausing awhile, for a solitary walk in which the mind might indulge itself in happy contempla-

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tions; then mingling in cheerful conversation and in the performance of various gymnastic exercises; then going to dine on the common meal of bread, honey, and water; afterward attending to public and domestic affairs, to bathing, and to the duties of religion; and then, as the last business before sleep, reviewing what had been done during the day. All this it pleases me to muse upon, in connection with the genius and works of that deep and mysterious man of history—Pythagoras. For thus I am taught that the most of his life was serenely and mightily intellectual. He was devoted to discovery.

I will caution you, reader, right here, lest you forget that Pythagoras lived in an age when thinking was not so much of a practical and utilitarian process, as it is in these days. So if you find, in the systems which he built up, out of his own discoveries, too many wild and subtle conceptions, going to indicate something of a habit of fanciful idealization, you will still have the utmost reverence for the great philosopher who professed himself to be a "lover of wisdom." Although his ideal masterpieces are more or less tinged with the mysticism of his mystic times, yet Pythagoras was the most practical explorer of nature of all that lived when he lived. What though he carried his reasonings about numbers beyond reason? You shall own that he discovered the five regular geometrical bodies—the cube, tetrahedron, octahedron, icosahedron, and dodecahedron—and that he originated the multiplication-table we use to-day. What though he extended his abstractions in regard to music into hopeless mathematical subtilities? You shall not deny that he developed musical proportions and laws, known, even in our times, to be as true as they are beautiful. What though he taught the absurd doctrine of the transmigration of souls? You shall concede that he unfolded new and noble views in regard to the origin and destiny of man. What though he held certain theories of astronomy which, in our age, appear strangely unreasonable? You shall grant that he was the first of the ancients to anticipate the system of Copernicus. For, wonderful as it may seem, he believed that the sun is the center of the planetary worlds, and that every star is a sun. He knew the causes of eclipses, and how to predict them. He knew that the earth is round, and that its surface is naturally divided into five zones, and that the ecliptic is inclined to its equator, and that this same earth daily revolves on its axis, and yearly wheels around the sun. He had found good reasons for believing that the Milky Way gets its whiteness from the innumerable little stars which

thickly cluster in it, and for believing that Lucifer and Hesperus were but the same beautiful Venus, bearing, in the one case, her morning, and in the other her evening name. And that same early astronomer, who so rightly read the "heavens of the Lord," without a telescope, could not fail even to see that the other worlds must, like ours, be inhabited by living and intelligent beings.

Stop, just now, reader, and think within yourself, how the discoverer, Pythagoras, must have reveled in the glorious light that filled his studious and contemplative soul! Did he not realize something of that luxury of joy which may be supposed to constitute the never-failing fruition of unfallen intelligences? What a splendid stand-point, in the universe of God, he must have regarded this world of ours! Do you wonder why it was that, amid a people given to sensual pleasures, he scorned to devote himself to other pursuits than such as tend to conquer appetite and passion? Do you wonder why it was that he so loved the still cloister of scholastic severities? Think of the mental freedom and vigor, think of the rapturous peace which were gained at the expense of that subordination of the flesh to the spirit, of that rigid application to tasks of solitary research, and at the habits of Pythagoras you shall no longer wonder. "Thou knowest best how to live, great man of the olden times!" I shall hear you say. And, without surprise, as if you were a humble learner, now, to-day, taking noble lessons from his lips, your memory shall fasten to those sayings of his, the truth of which his own life so well illustrated: "Strength of mind rests on sobriety, for this keeps the reason unclouded by passion." "No one is to be deemed free who has not perfect self-control." "Intoxication is a temporary madness." "The desire of the superfluous is folly, for it has no bounds."

There may be much, and there may be but little of reality in that fine theory in regard to the heavenly spheres, which has given a magical luster to the name of Pythagoras—that theory, which, as you will remember, contemplates the solar system as arranged with such a reference to number, distance, and time, as to make it one great harmonious whole, giving forth, in the varied movements of its parts through the ether, musical tones of most exquisite melody. Little of reality or much of reality, I say, there may be in this gorgeous conception of a grand organ, made up of restless planets, spinning and glittering around a central sun, the mysterious intonations of which have been singing, in space, through all the ages. But let that beautiful theory be true or false, cer-

tain it is that it points to a sublime thoughtfulness, as the habitual peculiarity of the genius of its originator. He who, in an age when the human race was but in the twilight of civilization, could so look away from the earth into the heavens, and see the creation of God in such a light of almost entrancing beauty and glory—tell me, was he not worthy, simply in the view one must take of the joy of his experience, to have it said of him, as those who loved to learn of Pythagoras used to say of him, that “he was the only mortal whom the gods had permitted to hear the harmony of the spheres?”

You and I can but imperfectly conceive how rich the intellectual felicities of Pythagoras must have been to him, and how satisfied he must have felt with them, as rewards of his patient labors of thought. It shall, however, help us not a little, perhaps, toward forming more truly and more vividly that conception, to recall the manner in which he is said to have expressed his intense delight, when he had made the brilliant discovery in geometry, that the squares described on the hypotenuse of a right-angle triangle, is equal to the sum of the squares described on the two other sides. It is recorded by Plutarch, that he offered an ox, and by other authorities, that he sacrificed even a whole hecatomb to the gods, as an indication of his great gratitude to them, for permitting him to enjoy such an experience of noble pleasure.

Not longer will I dwell upon Pythagoras.

II. Archimedes.

No man of science can hear with indifference the name of Archimedes; for that name is inseparable from science itself. From this man, this citizen of ancient Syracuse, there came forth into the world now scientific truths to change the aspects of civilization. He was a discoverer in more than one department of science.

He was a mathematical discoverer.

By methods depending on developments made by Archimedes, men to-day measure their curvilinear surfaces and solids.

What a penetrating mind was his, that he should have caught sight of unique relations and laws, where a thousand other minds saw nothing! What an intellectual Midas was he, that whatever he put his thoughts upon should have shone with a dazzling gold!

It was for none but him to take up the sphere and the cylinder, and by the discovery of a surprising proportion existing between the solid contents of these two magnitudes, when such has a base and altitude equal to those of the other, to make them tell of the power of one ancient man's

genius, to a generation of men more than two thousand years distant from his own. It was for none but him to take up the circle, and by developing the relation of its diameter to its circumference, to make it a charming celebrator of individual greatness, through all eras of subsequent history.

But, then, this said Archimedes, of whom I am speaking, was also a discoverer, and a great one too, in practical mechanics. He it was who developed the principle of the first compound pulley, and the first endless screw. His mind was full of mechanic theories, which he himself had constructed and proved true. He daily feasted his thoughts on discoveries made in solitude, by his ever-devolving genius. The historians of the past, Polybius, Livy, Plutarch, each indulges himself in admiration of the Archimedean ingenuity, as displayed in the military machines which the great discoverer projected and set in operation, to repel the attacks of the Romans, during the siege of Syracuse.

It is not known, and never will be known, how much of mechanics Archimedes carried in his mind, which he never found time or means to bring into light—how many wonderful arts he knew something of, which the circumstances of the times, or his own circumstances, would not permit him to see brought into useful play—how many vast machines lived in his brain, the wheels of which were silent to the world's ears, forever. Like most, if not all of the ancient discoverers, he himself had to be the one who realized the practical applications of his own great developments of natural law. In other words, he was both a discoverer and an inventor. And hence it was that when he had got hold of the theory of the compound pulley, he set himself to making a compound pulley; and when he had discovered the principle of the screw, he went and made a screw; and when he had found out the law, or laws, according to which some great war machine could be constructed, he looked about for the material and means by which to make it, and if he succeeded in finding them, really did make it. Not any living man can tell how many discoveries the wonderful Syracusan had made by which it came to be suggested to his mind, that if he only had a place to stand in without it, he could stir the solid globe from its orbit; but it is known that he was a practical man, for all the world has learned the Archimedean cry, “Give me where to stand, and I will move the world!” If Archimedes died with good volumes of unrevealed mechanics rolled up in his head, it must have been either from a want of patronage,

or because he had no point of available action to operate in.

But, then, Archimedes was also a discoverer in still another field of science.

You have many times read of his beautiful discovery in hydrostatics, and of the great holiday which took place in the soul over it. You need not be told about King Hiero's order for a crown to be made of pure gold, and about the deceitful artist who added an alloy to it by fraud, and about him who, while taking a bath, seized hold of the splendid principle, then for the first time discovered, that a body immersed in a fluid loses just as much in weight as the weight of an equal volume of the fluid, and about the application this man immediately made of the principle he had thus caught sight of, by which application he was able to determine to what an extent the King's crown of gold had been adulterated. You need not be told the fact, that when this man, Archimedes, had come to see, with certainty, what a fine discovery he had made, he was so filled with exultation, that, yielding to an impulse of wild, and almost insane delight, he leaped at once from his bathing-tub, and ran naked into the streets of Syracuse, shouting, "Eureka! Eureka!—I have found it! I have found it!"

Do you ask me to delay here, and attempt to describe the joyous ecstasy which must have more than filled the soul of that "glorious old heathen" then? Who can describe the Archimedean felicity? Not even Archimedes himself could have described it. The manner of its expression is all that can ever be portrayed. It would, indeed, seem that, in the hour of that mental triumph, the very faculties of the philosopher's mind had shaken off their usual restraints, and, with a beautiful manliness, like so many victors, were clapping their bright hands, and laughing their sublime rapture right out! And it is not at all unreasonable to think of him as so unspeakably happy, that even if the glory of the "third heaven" had burst through the skies upon him, his soul could not have been made happier.

But then it would be doing injustice to Archimedes, to suppose that this instance of intense pleasure was any other than a single one among many of a like kind, which were experienced during his lifetime. I will not believe, and you will not believe, that when he had discovered the mutual relation existing between the sphere and cylinder, his eyes grew not radiant with the light of an indescribable joy, and his heart throbbed not with the wild motion of a great transport, and his lips told not of the tumult of bliss going on within

him. History says, that, in order to immortalize this discovery, on which he himself set particular value, men placed on his tombstone a cylinder, with a sphere inscribed in it. Perhaps they did not imagine the real reason why he set such a special value on it; and, perhaps, again, they did conceive of that reason, well and truly. At all events, it shall give me delight to dream that they thus ornamented his monument, chiefly to perpetuate their own interest in that jubilee which he must have enjoyed in his soul, when he came to realize what a splendid triumph he had gained. And I can easily fancy that when Cicero, while acting as questor over Sicily, found this monument away back in a thicket, by which it was concealed, he fixed his philosophic eyes upon the cylinder and sphere which appeared upon it, and really exclaimed, "What a rapture these symbols are carrying through history!"

Why did Archimedes love, like Pythagoras, the seclusion of thought? Why, when the city of Syracuse had been taken possession of by the Romans, under Marcellus, was he found sitting in the market-place, deeply absorbed in serene study, over some geometrical figures he had drawn in the sand? Those superior pleasures, going to reward the labors of a mind devoted to discovery—these furnish the only satisfactory answer to all interrogatories of this kind!

"Disturb not my circle!" said he to the rough Roman soldier who came into his gentle presence to pierce him, and make his bright blood gush out over the ground. "Disturb not my circle!" Beautiful, and yet melancholy saying! What a fine comment on that lovely tranquillity of soul, which is the inheritance of the philosopher! What an endless perpetuator in human memories of the meanness of a mean soldier!

In recent American history, you and I, reader, have marked a tragical incident, which bears something of a resemblance to this one. Need I refresh your memory of that polished scholar and gifted orator of Massachusetts, who, not long since, on the floor of our national senate-chamber, was made to see, by an experience almost a martyr's, what it is that gives to the bully his strongest power to influence the human brain? It may better help our hearts to mourn for Archimedes, as he should be mourned for, now even in these times, so far from the age, and the hour, in which he was struck down, to call to mind some of the sharper incidents of this modern crime, and in grief and tears live them over again. Think, then, of the act of brutal cruelty done to that man, whose education, whose refinement, whose virtue, whose genius, whose deeds of manly self-

sacrifice, entitle him, if such can justly entitle any man to live forever in his country's annals, as one of the noblest of patriots! Think of the apology offered for that act by him who perpetrated it! Think of the extraordinary triumph of intellectual and moral force, for which that application of brute force was designed as a penalty! Think of the spot, crimsoned as was the wooden cross, along whose fibers ran the blood of the world's Jesus—that spot in which American eloquence seemed to reach a loftier strain, even imitating the high pitch of melody, and the mighty intensity of sublime heroism, which were common in the days of Patrick Henry! But this is not enough. You must go in thought still further. You must go and stand by the bed, where lies a great and wise senator, whose head is throbbing forever, with “a feeling as if quick and crushing blows were continually falling upon it.” You must see a countenance, which once glowed with the expression of inner splendors of thought, cast down and made to present only one “rigid record of protracted suffering.” Long, and long must you bend, with pitying and prayerful sorrow, over that prostrated victim of lawless vengeance. But, thank God! although Archimedes perished, the smitten orator still lives.

The brutal warrior saw no sublime meaning in the last words of Archimedes, and, as he pierced the peaceful man of science, had not soul enough to see that he was only opening a way for him to the perfection of that bliss of which he had already enjoyed so many happy foretastes.

PERVERSIONS OF SOCIAL LIFE.

THE loss of that, the possession of which enriches not, is a benefit rather than an injury. We do not lose faith in society, but in its perversions and its emptinesses. They who look to it for instruction, entertainment, or affection, are equally disappointed; and yet it contains all these, but so rarely realized, that faith falters, and we harden into doubt, or falter in despair. Stern and solid men exact the useful and substantial, but all the rest are for show only, with persons splendidly attired, but intellects miserably furnished. The former have no soul, and the latter no heart; and between the two, although surrounded by myriads, we are left without a friend, a confident, or a companion, and are

“Homeless amidst a thousand homes.”

“O, we are querulous creatures! Little less
Than all things can suffice to make us happy,
And little more than nothing is enough
To make us wretched.”

A LEGEND OF THE YBURG.

THE numerous demolished and ruined citadels and castles, which adorn the dark heights of the Black Forest, overlooking with their gray, moss-covered watch-towers and battlements the green valleys, bestow upon this beautiful country a still greater charm. The history of a time gone by, rich in eventful deeds, speaks to us out of many of these ruins, while of others hardly any thing is known than their name. Numerous were the races which have grown up to great power but have died long since, for the most part, before the decay and ruin of their ancestral castles. Of several, history can relate many noble deeds; others passed through life without leaving any traces behind, or any remembrance save that of their own, or their ancestor's names; was it that they lived an inglorious or obscure existence, or that historians have failed to note down what they did worthy of praise? This was the case with the former possessors of the castle of Yburg; they were little known, though the castle standing upon the steep, abrupt height of a mountain covered with dark fir-trees, unquestionably offers a more magnificent view than all the other ruins; it is besides seventy feet high, and its strong tower immeasurable. When the eye first glances over the splendid landscape, it wanders about for a long time from one object to another, and requires some moments before it gets accustomed to this extreme richness, and can contemplate, in quiet and leisure, the details of this charming picture. Fifty years ago two of these immense stone towers were standing, but about that time one was struck by lightning, and now only a few remains of it exist.

The ruins which are still standing, particularly the surrounding walls, are of considerable circumference, and prove that Yburg must have been once upon a time the residence of a very mighty race. Nothing is known of its other buildings, how they came to be destroyed, or of the possessor of the castle. It is seldom spoken of in history, or in records, and then only when the ancient race had been long extinct, and the estate had fallen into the hands of the Margraves of Baden. But though history has nothing to relate of these fortified ruins, tradition has supplied what was wanting, and many are the legends which the people narrate of them; the following may be considered as one of the most interesting:

The last descendant and inheritor of the lords of Yburg, Knight Erkebrecht, had wasted and spent his rich estates in a riotous, wild kind of